Railroad Commission of Texas

Alternative Fuels Research & Education Division (AFRED)

LPG Workshop

U.S. Department of Energy
Clean Cities International Program
Secretaría de Energía (SENER)

Mexico City
November 7, 2003

State-Level Incentives for LPG Use

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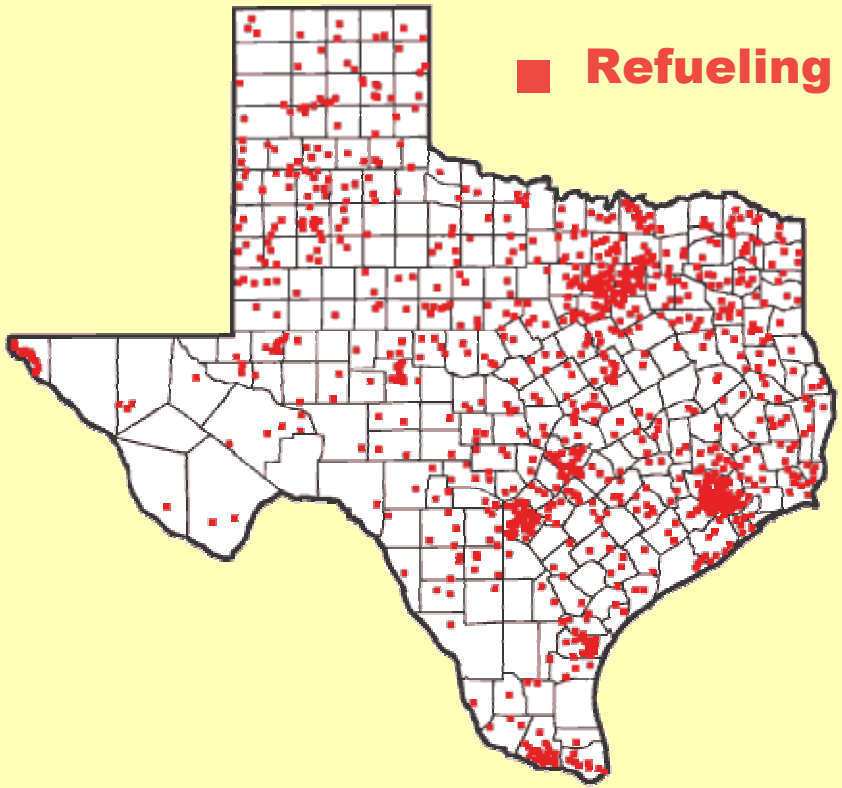
Texas LPG Checkoff Program

LPG in Texas

- Texas ranks first among U.S. states in the production and consumption of LPG.
- ~ 90 percent is used as manufacturing feed stock.
- ~ 10 percent is odorized and marketed as fuel.
- Competitors: each other; electricity, diesel, gasoline
- ~ 1,050 retail outlets

Texas LPG Checkoff Program

LPG in Texas



More than 1,000 public refueling sites in Texas

LPG in Texas, 1991

- Competing ineffectively; long-term decline in every market; lost 60MM gal./yr. to electricity
- Old technology
- No marketing tools or coordinated marketing strategy
- Little technical training or worker safety training
- Poor public image
- No state or federal grants or other assistance
- RESPONSE: self-help “checkoff,” effective August 1991

AFRED Programs

- Research, development & demonstration
- Employee safety training
- Marketing
- Public education

Research & Development

- NEED: cleaner, more efficient, year-round technology
- Low-emission engines
- Clean agricultural uses
- On-site electricity generation
- AFRED'S ROLE: develop and demonstrate new technology for Texas, through public/private partnerships

Current AFRED R&D projects

2007-certified

LPG industrial

forklift truck engine

(US$1.4M, PERC, Southwest Research Institute)

Current AFRED R&D projects

Residential 5 kW

LPG fuel cell

(US$1.43M, PERC, Plug Power, HyRadix)

Current AFRED R&D projects

LPG fuel processor
(US$1.43M, PERC, Plug Power, HyRadix)

Current AFRED R&D projects

74-hp LPG tractor

(US$350K, John Deere, PERC, Southwest Research)

Current AFRED R&D projects

LPG weed/pest/ pathogen control

(US$978K, cotton, vegetables, broiler chickens)

Current AFRED R&D projects

LPG switcher locomotive—US$3.9M
(pending)

Safety Training

- NEED: safe, competent work force
- 10,000 LPG workers in Texas, all certified by RRC
- Certified workers must take one eight-hour class in their area of certification the first year and every four years thereafter.
- AFRED trained 2,863 students in fiscal year 2003.
- 79 percent of classes held outside Austin
- Automotive training includes fleet and forklift technicians, aftermarket converters, school districts.

Safety Training

Course catalog

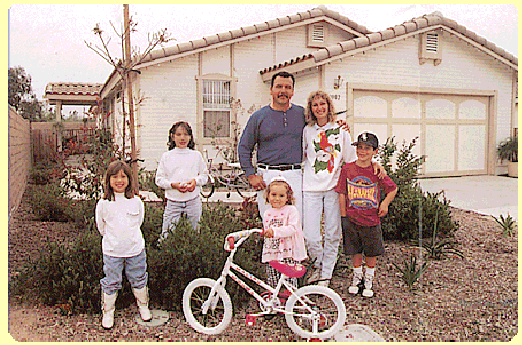
Keyed to categories of LPG certification

- LP-Gas Basics
- ASME Tanks/DOT Cylinders
- Bobtail Operations
- Residential System Design
- Cylinder Filling
- Residential System Installation
- Appliance Controls
- Residential System Inspection
- Appliance Troubleshooting
- Regulatory Compliance

Marketing & Public Education

- NEED: coordinated marketing strategy; marketing tools; visibility, consistent positive image
- Market research (e.g., LPG tractor, 5 kW fuel cell)
- Consumer rebates (US$1.2M a year)
- Incentives for manufactured housing, highway signs, propane school buses, closed-loop forklifts, commercial mowers

Marketing & Public Education



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STATE-LEVEL INCENTIVES FOR LPG USE

Marketing & Public Education

- LPG access to federal low-income energy assistance
- Trade shows and exhibits
- Advertising/media rebates/marketer web sites
- Marketer co-op advertising
- *Propane Services Directory* and web site
- Secondary school science curriculum supplement

Marketing & Public Education

LPG access to federal low-income energy assistance

Marketing & Public Education

Trade shows and exhibits

Marketing & Public Education

Marketer co-op advertising

Marketing & Public Education

Advertising/media rebates/marketer web sites

Marketing & Public Education

***Propane Services Directory* and web site**

Marketing & Public Education

Middle-school science curriculum supplement

Marketing & Public Education

News releases

RAILROAD COMMISSION OF TEXAS

STATE-LEVEL INCENTIVES FOR LPG USE

Marketing & Public Education

Current/pending market research

- LPG switcher locomotive (2003)
- John Deere propane tractor (in progress)
- 5 kW residential fuel cell (in progress)
- Heavy-duty propane agricultural engine (pending)

Marketing & Public Education

Consumer rebates, fiscal 2004

Water heater	
new construction	$150
replace electric	$300
All-LPG home	$750
Budget:	**$1,163,157**

AFRED Funding

Texas LPG Delivery Fee

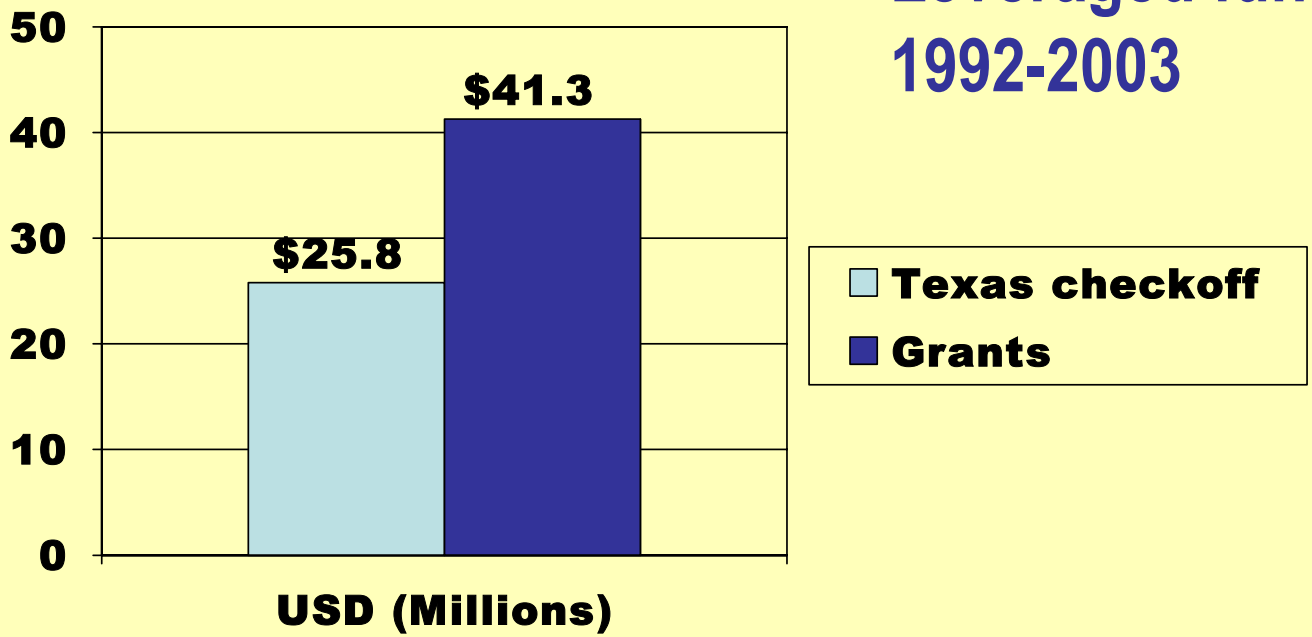
- ~ US$0.005/gallon on odorized LPG; exports exempt.
- Assessed at the time odorant is added or odorized LPG is imported.
- Marketer pays supplier; supplier remits monthly to RRC
- Average revenue $2.15M/year
- 50 percent is dedicated by statute to consumer rebate programs.

AFRED Funding

Leveraged funds history

- Since 1992, AFRED has leveraged $41.3 million for LPG in Texas . . .
- $10.9 million through the Railroad Commission, and
- $30.4 million through other entities (e.g., marketers, fleet operators, agencies, research organizations).

AFRED Funding

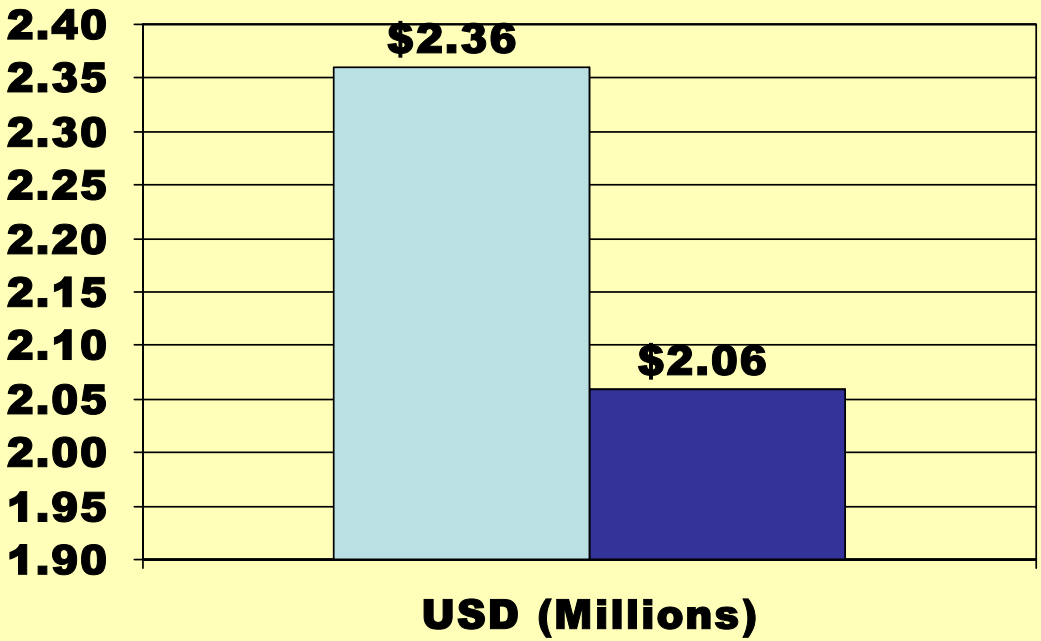


Leveraged funds 1992-2003

AFRED Results

- Based on delivery-fee revenue, Texas' retail gallons have increased an average of 1.6% per year since 1992.
- 70 percent of full-service marketers use AFRED programs and materials.
- Model for 10 other state LPG checkoffs since 1991
- Model for U.S. national checkoff (Propane Education and Research Council, 1998)

AFRED Funding

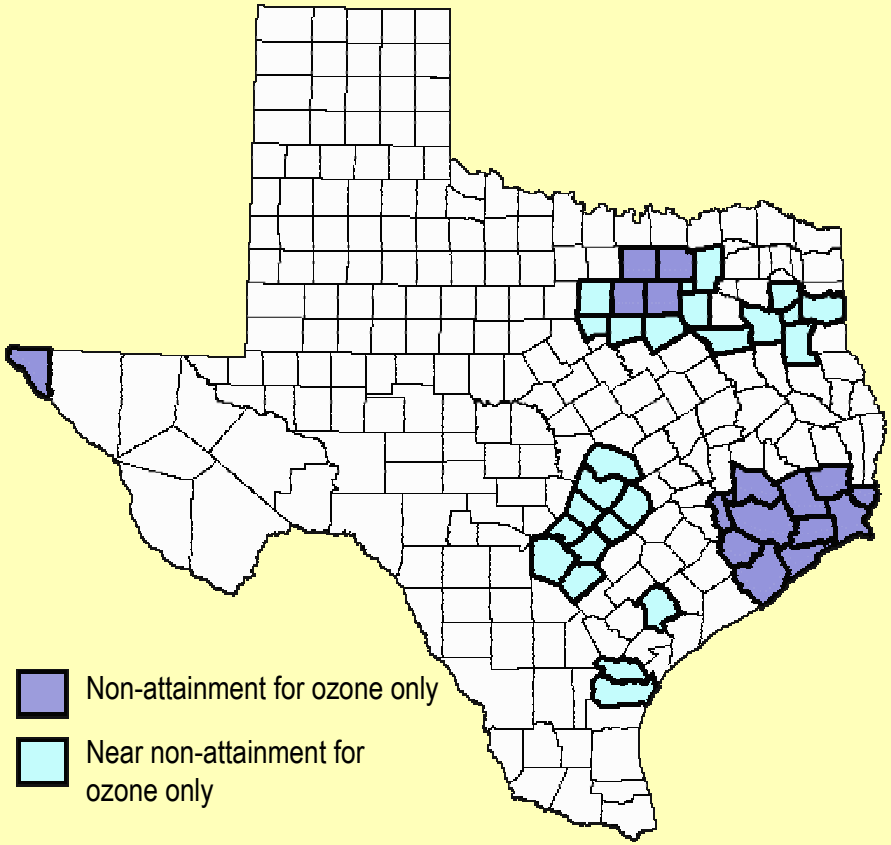


15% increase in delivery-fee revenues since 1992

Texas Emissions Reduction Plan (TERP)

- Texas must reduce NOx in Houston and Dallas areas by 35 tons per day (TPD) by 2007 to meet federal standards.
- The Texas Legislature created TERP in 2001 to achieve these reductions, plus an additional 20 TPD of the 56 total TPD required in Houston.
- Other TERP-eligible areas are Beaumont-Port Arthur, El Paso, Austin, San Antonio, Tyler and Corpus Christi.
- TERP is administered by the Texas Commission on Environmental Quality.

Affected counties



TERP Funding: $150M/year

- Average revenue US$150 million/year, 2004-2008
- 87.5 percent ($131M) for emission-reduction grants
- 9.5 percent ($14.2M) for new technology: research, development and demonstration
- 3.0 percent ($4.5M) administration
- No funding for light-duty vehicle purchases or leases.
- No funding for energy-efficiency programs.

Incremental costs

- TERP grant pays the incremental cost of cleaner equipment.
- Example:
  - To replace an existing diesel engine with a cleaner engine costs $20,000.
  - TERP will pay $20,000 towards the purchase of the cleaner engine, which could be LPG.

New purchase or lease

- On-road vehicles > 8,500 lb (>3,864 Kg) and non-road equipment >25 hp (>18.6 KW) are eligible.
- Must be certified 25 percent lower NOx than current federal standard.
- Grant covers incremental cost above baseline.
- Any fuel type; LPG is eligible.
- Vehicle must operate 75 percent in affected counties.
- Must cost <US$13,000/ton (<$11,791/metric ton) of NOx reduced.

Engine repower / replacement

- “Repower” means replacing the engine of an existing vehicle or piece of equipment.
- The replacement engine must be certified at 25 percent lower NOx than the engine being replaced.
- The old engine must be scrapped.
- Project must reduce NOx for less than $13,000/ton.

Retrofits or add-ons

- “Retrofit” means at the time of rebuilding an existing engine, installing a “kit” that reduces NOx at least 25 percent below the original certification level.
- “Add-on” means installing a “kit” that reduces NOx at least 25 percent below the original certification level in the absence of a complete rebuilding of the engine.
- Must meet the <$13,000/ton requirement.

Replacements (proposed)

- Replace old vehicle or equipment with new or newer vehicles or equipment.
- New vehicle or equipment must be certified 25 percent lower NOx than the old vehicle or equipment.
- Old vehicle or equipment must be scrapped or removed from Texas and not returned.
- Incentive amount based on cost-effectiveness, not to exceed the cost of the replacement vehicle or equipment, minus scrap value.

Stationary engines (proposed)

- Engines <25 hp (<18.6 KW)
- May include: lease/purchase; replacement; repower; retrofit/add-on; infrastructure
- Qualifying fuels eligible, e.g., LPG
- Limited to stationary engines that are not required to meet emissions standards under existing rules or permit conditions (e.g., most agricultural equipment).

Refueling infrastructure

- TERP will pay for the costs of on-site refueling stations for qualifying fuel (e.g., LPG).
- Will pay for the costs of on-vehicle infrastructure projects to reduce engine emissions while idling.
- Infrastructure projects are exempt from $13,000 per ton cost-effectiveness requirement.

Incremental fuel costs

- TERP will pay for any incremental cost difference between a conventional fuel and a “qualifying fuel,” e.g., LPG.
- Contracts limited to 30 months and may be renewed.
- Must meet the $13,000/ton threshold.

Demonstration projects

- Projects that demonstrate practical, low-emission re-power, retrofit and other advanced technologies for on-road heavy-duty vehicles and off-road equipment.
- May include use of LPG for new engines and vehicles that may produce very low NOx emissions.
- Will pay for most costs associated with the project, subject to case-by-case determination.

Third-party grants

- TCEQ may consider allowing third parties to apply for grants on behalf of vehicle or equipment operators.
- Pass-through programs: third party solicits, awards, contracts for, and monitors grant award.
- Must comply with TCEQ grant requirements.
- Still to be determined when and how the TCEQ would solicit and award a third-party grant.

Small-business grants

- “Small business” means an entity that owns only two vehicles or pieces of equipment, one of which is either a pre-1994 vehicle or non-road equipment with an uncontrolled engine.
- Initially, limited to repower and replacement grants for the eligible vehicles or equipment.

School buses

- New school buses (LPG, natural gas or cleaner diesel technology)
- Replace or repower older school buses
- Retrofits and add-on systems for school buses (e.g., EGR, Selective Catalytic Reduction (SCR), new catalyst systems)
- Use of qualifying fuel (e.g., LPG, ultra-low sulfur diesel)

Next steps for TERP

- Adoption of new guidelines: October 24, 2003
- Consolidation of research, development and demonstrations in TCEQ: November 1, 2003
- New program funding: November/December
- Requests for proposals: December/January 2004
- Full implementation: 2004

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